

DRAFT:9/99

FLORIDA NATURAL RESOURCE USE VALUE DIGEST

PREPARED FOR THE NATIONAL OCEANIC AND

ATMOSPHERIC ADMINISTRATION FOR USE IN

RESEARCH ON RESOURCE USE VALUES IN THE

STATE OF FLORIDA

1999

## CATEGORIES OF METHODOLOGIES FOR

### ESTIMATING USE VALUE OF NATURAL RESOURCES

#### 1. CONTINGENT VALUATION METHOD(CVM)

In its simplest form, this method consists of asking questions to the user of a natural resource with respect to what they would either be willing to pay(WTP) or willing to sell the right to use a specific resource such as a day at the beach. This method may be open-ended where respondents(i.e., users) are asked to state their WTP. In other cases, respondents may be given a dollar figure for the natural resource use and asked to respond “yes” or “no”. In this way, the respondent has a dichotomous choice. There are many statistical techniques that can be used in conjunction with the dichotomous choice such as the Turnbull Distribution; logit; and probit methods to arrive at the use value of the natural resource. In the Digest that follows, the CVM will be used for the contingent valuation method in general. The user will have to either consult the annotated bibliography or the original citation to explore how the CVM was implemented and what particular statistical techniques were used.

#### 2. TRAVEL COST METHOD(TCM)

This method employs the relationship between number of trips (or days) to the site of the natural resource and the travel cost to the site. It is hypothesized that the number of days will decline as travel cost increases for the individual and groups of people at a particular site. The travel cost is calculated in terms of expenses to get to the site; sometimes on-site costs and may include the opportunity cost of time (i.e., a user could be working rather than recreating). The Digest to follow will simplify by using two classes of the travel cost method (TCM): (1) The TCM using travel cost and/ or the opportunity cost of time and (2) RUM or the travel cost method (i.e., Random Utility Model) using not just one site, but all alternative sites the users could choose.

#### 3. ALL OTHER METHODS (HPM; MPM)

This third classification is meant to include all other approaches other than the CVM and the TCM discussed above. This includes the hedonic pricing models (HPM) where actual market prices of good related to natural resources are used in conjunction with attributes of these goods. For example, housing prices may be used to reflect the WTP for air quality, a natural resource. Another method employs the marginal productivity of a natural resource to a user group to estimate the market value of that resource when it is not ordinarily priced in a market such as wetlands. This we shall call the MPM. There are numerous other methods that have been used to estimate use value of the resource. These are usually variations of the CVM discussed above.

COASTAL/MARINE

FISHERIES	3
(A) VALUES PER UNIT OF TIME	3
(B) INCREMENTAL VALUES PER FISH	5
MAMALS	6
REPTILES	6
WETLANDS	6
BEACHES	7
ARTIFICIAL REEFS	10
NATURAL REEFS	11
PARKS	11
WATER RESOURCES	12

FRESHWATER

LAKES AND RIVERS	13
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HOW TO USE THE USE VALUE DIGEST

If you would like to know the use value found in the literature for a particular natural resource and/or recreational activity using that natural resource, first refer to the above Index or categories of resources. For example, if a beach has been damaged by oil, you might want to know the range of beach use values found at various places in the State of Florida. Look under beaches. A fishery may be reduced in abundance because of a toxic spill. In this case, you may wish to look at the use values found for various groups or species of fish. When you have found the relevant category, we have listed the authors of the study first followed by, in most case, the WTP (willingness to pay) per day. This is the “use value” with which the use value digest is concerned. The WTP/day is followed by more specifics on what the number refers to such as location of the resource and kinds or species. For example, if you look under fisheries, you may be concerned with King Mackerel. This is found in the last column of the Digest along with whether the number refers to residents (R) of Florida or visitors from outside this area (V). Of special significance, please look at the numbers in parentheses. These are footnotes to the Digest that give qualifications to the entry. Be sure to reach these carefully. For example, a King Mackerel daily use value may only refer to that segment of the industry involved in charter boat fishing. Finally, be sure to consult the annotated bibliography cited in the Digest to get a fuller description of the study and where the original study may be found. If any problem arises in obtaining the original study, please call the NOAA Economist at 301-713-3000, ext. 138. It is hoped that this will be a useful tool for all persons interested in use value of a resource. Remember, the “use value” is the willingness of the user to pay for the use of a natural resource for which there is no organized market for exchange.

TABLE 1  
A COMPREHENSIVE INVENTORY OF USE VALUE PER UNIT  
OF TIME FOR RECREATIONAL/ OTHER NATURAL RESOURCES IN  
FLORIDA COMPILED FROM THE ANNOTATIVE BIBLIOGRAPHY  
IN 1998 DOLLARS

<u>RESOURCE</u> <u>CLASS</u>	<u>AUTHOR/DATE</u>	<u>WTP/DAY</u> <u>(DOLLARS)</u>	<u>METHOD</u>	<u>SITE/KIND</u>	<u>USER</u> <u>R=RESIDENT</u> <u>V=VISITOR</u>
<u>COASTAL/</u> <u>MARINE</u>					
<u>FISHERIES</u>					
<u>(A) Values Per</u> <u>Unit of Time</u>					
	Arndorfer&Bockstael (1986)	\$269-\$982	TCM	Gulf of Mexico/ King Mackerel (1)	R/V
	Leeworthy (1986)	\$68	TCM	All Florida/ King Mackerel(2)	R/V
	Leeworthy (1997)	\$69	TCM	Florida Keys/ All Species	R/V
	Platt (1989)	\$70	TCM	Destin/Panama City/Grouper(1)	R/V
	Green (1989)	\$94	TCM	All Florida/ Red Drum	R/V
	McConnel&Strand (1994)	\$107	RUM	All Florida/R/ All Species	R/V
	Glasure (1987)	\$24	TCM	All Florida/ All Species	R
	Green (1984)	\$84	TCM	All Florida/ All Species	V

TABLE 1 (CONT'D)

<u>RESOURCE</u> <u>CLASS</u>	<u>AUTHOR/DATE</u>	<u>WTP/DAY</u> <u>(DOLLARS)</u>	<u>METHOD</u>	<u>SITE/KIND</u>	<u>USER</u> <u>R=RESIDENT</u> <u>V=VISITOR</u>
COASTAL/ MARINE (Cont'd)					
<u>FISHERIES(Cont'd)</u>					
	Green (1984)	\$21	CVM	All Florida/ All Species(3)	V
	Green (1984)	\$70	CVM	All Florida/ All Species(4)	V
	Bell (1992)	\$ 4	CVM	All Florida/ All Species	V
	Bell&Leeworthy(1981)	\$69	CVM	All Florida/ All Species	V
	Bell&Leeworthy(1981)	\$52	CVM	All Florida/ All Species	R
	Green et al (1992)	\$810	TCM	GulfMexico/R/ Reef Fish	V
	Green et al (1997)	\$1.71	RUM	Tampa Bay/ All Species(5)	R/V
	Green et al (1997)	\$3.73	RUM	Tampa Bay/ All Species (6)	R/V
	Milon&Apogee(1996)	\$1.76	TCM	Indian River Lagoon/Redfish/ (7)	R
	Milon&Apogee(1996)	\$1.85	TCM	Ind. R. Lagoon/ Snook /(7)	R
	Milon&Apogee(1996)	\$2.37	TCM	Ind. R. Lagoon/ Trout /(7)	R

TABLE 1 (CONT'D)

<u>RESOURCE</u> <u>CLASS</u>	<u>AUTHOR/DATE</u>	<u>WTP/DAY</u> <u>(DOLLARS)</u>	<u>METHOD</u>	<u>SITE/KIND</u>	<u>USER</u> <u>R=RESIDENT</u> <u>V=VISITOR</u>
COASTAL/ MARINE (Cont'd)					
<u>(B) Incremental</u> <u>Value Per Fish</u>					
	Platt(1989)	\$67-\$73	TCM	Destin/Panama City/ Grouper /(8)	R
	Green(1989)	\$48-\$64	TCM	All Florida/ Red Drum/ (9)	R
	Andorfer& Bockstael (1986)	\$149-\$460	TCM	Destin/Panama City/(8)	R
	Milon et al(1994)	\$1.68-\$2.26	CVM	Indian River LagoonRedfish/(9)	R
	Milon et al(1994)	\$ .14-\$ .81	CVM	Indian River Lagoon/ Seatrout/(9)	R
	Milon et al(1994)	\$ .01-\$ .03	CVM	Indian River Lagoon/ Mullet/(9)	R
	Milon et al(1994)	\$ .12-\$ .23	CVM	Indian River Lagoon/ Sheepshead/(9)	R
	Milon et al(1994)	\$ .13-\$ .34	CVM	IndianRiver Lagoon/ Pompano/(9)	R
	Milon et al (1994)	\$.34-\$ .79	CVM	Indian River Lagoon/ King Mackerel/(9)	R
	Milon et al(1988)	(\$3.47) – (\$6.42)	TCM	Gulf of Mexico/ King Mackerel/(9)	R

TABLE 1 (CONT'D)

<u>RESOURCE</u> <u>CLASS</u>	<u>AUTHOR/DATE</u>	<u>WTP/DAY</u> <u>(DOLLARS)</u>	<u>METHOD</u>	<u>SITE/KIND</u> <u>R=RESIDENT</u> <u>V=VISITOR</u>	<u>USER</u>
<u>COASTAL/</u> <u>MARINE (Cont'd)</u>					
<u>MAMMALS</u>					
	Bendle&Bell (1995)	\$16.70	CVM	All Florida/ Manatee/(10)	R
	Fishkind(1993)	\$71.00	CVM	4 Fl. Counties/ Manatee/(10)	R
<u>REPTILES</u>					
	Milon&Remal(1996)	\$60.26-\$108.11	CVM	Florida/Sea Turtles/(10)	R
<u>WETLANDS</u>					
	Bell (1989)	\$51.01	MPM	Gulf of Mexico/ Saltwater Marsh/ All Esturine-Dep Commercial Fish/ (11)	R/V
	Bell (1989)	\$826 (11)	MPM	Atlantic Ocean offR/Fl./Saltwater Marsh/Recreational Fishers/(12)	R/V
	Bell(1989)	\$ 80 (12)	MPM	Gulf of Mexicof/ Fl./Saltwater Marsh/ Recreational Fishers/	R

TABLE 1 (CONT'D)

<u>RESOURCE</u> <u>CLASS</u>	<u>AUTHOR/DATE</u>	<u>WTP/DAY</u> <u>(DOLLARS)</u>	<u>METHOD</u>	<u>SITE/KIND</u>	<u>USER</u> <u>R=RESIDENT</u> <u>V=VISITOR</u>
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COASTAL/  
MARINE (Cont'd)

WETLANDS (Cont'd)

Lynne et al (1981)	\$ .91	MPM	Gulf of Mexico/ Saltwater Marsh/ Blue Crab Com. Fish Only/(11)	R
Milon&Remal(1996)	\$82.23-\$115.06	CVM	Florida/Seagrass/ (10)	R
Milon&Remal(1995)	\$ 3.98-\$ 62.72	CVM	Indian River Lagoon/ Wetland Land Acquisition/(10)	R
Milon&Remal(1995)	\$1.42-\$51.61	CVM	Indian River Lagoon/ Wetland Rest- oration/(10)	R

BEACHES

Curtis&Shows(1984)	\$6.93	CVM	Jacksonville Beach	R
Curtis&Shows(1984)	\$6.98	CVM	Jacksonville Beach	V
Curtis&Shows(1982)	\$3.75	CVM	Delray Beach	R
Curtis&Shows(1982)	\$3.77	CVM	Delray Beach	V
Bell (1986)	\$2.60	CVM	Pompano Beach	R



TABLE 1 (CONT'D)

<u>RESOURCE</u> <u>CLASS</u>	<u>AUTHOR/DATE</u>	<u>WTP/DAY</u> <u>(DOLLARS)</u>	<u>METHOD</u>	<u>SITE/KIND</u>	<u>USER</u> <u>R=RESIDENT</u> <u>V=VISITOR</u>
<u>COASTAL/</u>					
<u>MARINE (Cont'd)</u>					
<u>BEACHES (Cont'd)</u>					
	Bell (1986)	\$1.80	CVM	Spanish&Red Reef Parks/ Boca Raton	R
	Bell(1986)	\$8.51	CVM	Spanish&Red Reef Parks/ Boca Raton	V
	Bell (1992)	\$2.50	CVM	All Florida	V
	Bell&Leeworthy(1990)	\$54.00	TCM	All Florida	V
	Bell&Leeworthy(1986)	\$2.06	CVM	All Florida	R
	Bell&Leeworthy(1986)	\$2.28	CVM	All Florida	V
	Bell&Leeworthy(1986)	\$16.08	TCM	All Florida	R
	Bell&Leeworthy(1986)	\$46.08	TCM	All Florida	V
	Leeworthy(1997)	\$67.00	TCM	Florida Keys	R/V
	Leeworthy(1994)	\$70.00	TCM	Clearwater Beach	R/V
	Leeworthy (1994)	\$18.61	TCM	Honeymoon Island State Rec. Area	R/V
	EERG(1998)	\$22.75	RUM	Pinellas County /	R

TABLE 1 (CONT'D)

<u>RESOURCE</u> <u>CLASS</u>	<u>AUTHOR/DATE</u>	<u>WTP/DAY</u> <u>(DOLLARS)</u>	<u>METHOD</u>	<u>SITE/KIND</u>	<u>USER</u> <u>R=RESIDENT</u> <u>V=VISITOR</u>
<u>COASTAL/</u>					
<u>MARINE(Cont'd)</u>					
<u>BEACHES (Cont.)</u>					
—	Stronge & Schultz (1997)	\$4.31	CVM	Broward County/ Weighted Average/ All Visitors	R/V
	Stronge & Schultz (1997)	\$3.93	CVM	Broward County/ County Residents	R
	Stronge & Schultz (1997)	\$4.27	CVM	Broward County/ Other FL Residents	R
	Stronge & Schultz (1997)	\$4.52	CVM	Broward County/ Other U.S. Visitors	V
	Stronge & Schultz (1997)	\$5.20	CVM	Broward County/ International Visitors	V
	Stronge & Schultz (1997)	\$4.94	CVM	Delray Beach/	R/V
	Stronge & Schultz (1997)	\$4.12	CVM	Anna Marie Island	R/V
	Stronge & Schultz (1997)	\$ 7.00	CVM	Captiva Island	R/V
	Leeworthy (1999)	\$32.06	TCM	Daytona Beach	R/V
	Leeworthy (1999)	\$34.27	TCM	Hugh Taylor Birch State Rec. Area/ Ft. Lauderdale Beach	R/V

TABLE 1 (CONT'D)

<u>RESOURCE</u>	<u>AUTHOR/DATE</u>	<u>WTP/DAY</u>	<u>METHOD</u>	<u>SITE/KIND</u>	<u>USER</u>
<u>CLASS</u>		<u>(DOLLARS)</u>			<u>R=RESIDENT</u> <u>V=VISITOR</u>

COASTAL/  
MARINE(Cont'd)

BEACHES (Cont.)

	Leeworthy (1999)	\$47.76	TCM	St. Andrews State Recreation Area	R/V
	Leeworthy (1999)	\$42.59	TCM	St. George Island State Park	R/V
	Leeworthy (1999)	\$31.19	TCM	Gulf Islands National Seashore	R/V

ARTIFICIAL  
REEFS

	Bell et al (1998)	\$9.01 - \$11.32	TCM	Northwest FL Reef Fish/ Weighted Avg. All Modes	V
	Bell et al (1998)	\$4.94 - \$6.54	TCM	Northwest FL Reef Fish/ Own Boat	V
	Bell et al (1998)	\$11.63 - \$16.44	TCM	Northwest FL Reef Fish/ Charter Boat	V
	Bell et al (1998)	\$5.96 - \$6.55	TCM	Northwest FL Reef Fish/ Party Boat	V
	Bell et al (1998)	\$4.22 - \$8.63	TCM	Northwest FL Reef Fish/ Private Rental	V

TABLE 1 (CONT'D)

<u>RESOURCE CLASS</u>	<u>AUTHOR/DATE</u>	<u>WTP/DAY (DOLLARS)</u>	<u>METHOD</u>	<u>SITE/KIND</u>	<u>USER</u> <u>R=RESIDENT</u> <u>V=VISITOR</u>
<u>COASTAL/ MARINE(Cont'd)</u>					
<u>ARTIFICIAL REEFS (Cont'd)</u>					
	Bell et al (1998)	\$4.08 - \$8.50	CVM	Northwest FL/ Reef Fish/ All Boat Modes	V
	Bell et al (1998)	\$3.35 - \$6.97	CVM	Northwest FL/ Reef Fish/ All Boat Modes	V
	Bell et al (1998)	\$2.16 – \$4.92	CVM	Northwest FL/ Reef Fish/ All Boat Modes	R
	Bell et al (1998)	\$1.80 - \$4.10	CVM	Northwest FL/ Reef Fish/ All Boat Modes	R
	Milon (1988)	\$1.36-\$2.02	CVM	Dade County/ Reef Fish	R
	Milon (1988)	\$ .24- \$1.57	CVM	Dade County/ Reef Fish	R
<u>NATURAL REEFS</u>					
	Milon&Remal(1995)	\$74.71 - \$109.62	CVM	Florida/Coral (10)	R
<u>PARKS</u>					
	Leeworthy(1989)	\$469	TCM	John Pennekamp Coral Reef Park/ Diving/Boating	R/V

TABLE 1 (CONT'D)

<u>RESOURCE CLASS</u>	<u>AUTHOR/DATE</u>	<u>WTP/DAY (DOLLARS)</u>	<u>METHOD</u>	<u>SITE/KIND</u>	<u>USER</u> <u>R=RESIDENT</u> <u>V=VISITOR</u>
<u>COASTAL/ MARINE(Cont'd)</u>					
<u>PARKS (Cont'd)</u>					
	Leeworthy(1999)	\$ 79.37	TCM	Everglades National Park Coastal part of park	R/V
<u>WATER RESOURCES</u>					
	Leeworthy(1997)	\$74.64	TCM	FL. Keys/ Snorkeling	V
		\$75.39	TCM	FL. Keys/ Scuba Diving	V
		\$71.33	TCM	FL. Keys/ Personal Water- craft Use	V
		\$63.31	TCM	FL. Keys/ Sailing	V
		\$74.40	TCM	FL. Keys/ Other Boating	V
		\$59.24	TCM	FL. Keys/ Windsurfing	V
	Milon&Remal	\$27.13- \$68.51	CVM	Indian River Lagoon/Storm- Water Control To Improve Water Qual (10)	R

TABLE 1 (CONT'D)

<u>RESOURCE</u> <u>CLASS</u>	<u>AUTHOR/DATE</u>	<u>WTP/DAY</u> <u>(DOLLARS)</u>	<u>METHOD</u>	<u>SITE/KIND</u>	<u>USER</u> <u>R=RESIDENT</u> <u>V=VISITOR</u>
<u>FRESHWATER</u>					
<u>LAKES &amp; RIVERS</u>					
	Bell et al (1995)	\$4.16	TCM	Lake Jackson/ Leon County/ Multi-Use	V
	Bell et al (1998)	\$3.20	TCM	Lake Tarpon/ Pinellas County/ Multi-Use	V
	Stratis & Bendle	\$13.41	TCM	Rodman Reservoir/ Putnam County/ Fishing	V/R
	Stratis & Bendle	\$11.12	TCM	Rodman Reservoir/ Putnam County/ Fishing	R
	Stratis & Bendle	\$9.07	TCM	Oklawaha River/ Marion County/ Multi-Use	V/R
	Stratis & Bendle	\$7.52	TCM	Oklawaha River/ Marion County/ Multi-Use	R

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1. Charter boats only
  2. All modes of fishing
  3. Shore fishing only
  4. Offshore fishing only
  5. Tampa Bay only
  6. Tampa Bay and Pinellas County
  7. WTP per fish caught per trip. Must be multiplied by average number of fish caught per day to derive WTP/day.
  8. One additional kept fish per trip for charter boat fishing only
  9. One additional kept fish per trip
  10. WTP/Household/Year
  11. Ex Vessel Value/Acre/Year
  12. WTP/Acre/Year